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| 10/612,184 | 07/02/2003 | Hideki Moriyama | HP0070 US NA | 5284 |

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4417 LANCASTER PIKE
WILMINGTON, DE 19805

EXAMINER

AHMED, SHEEBA

ART UNIT PAPER NUMBER

1773

DATE MAILED: 05/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/612,184

Applicant(s)

MORIYAMA ET AL.

Examiner

Sheeba Ahmed

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5 and 7-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5 and 7-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Amendments to claims 1, 2, and 7-12 have been entered in the above-identified application. Claims 3, 4, and 6 have been cancelled. **Claims 1, 2, 5, 7-12 are now pending.**

Claim Objections

2. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

There are two claims numbered 7 in this amendment. The second misnumbered claim 7 has been renumbered 8 and hence the numbering of all claims following misnumbered 7 has also been corrected. Correctly numbered claims must be presented in reply to this Office Action.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

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only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2, and 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Chacko (US 6,617,377 B2).

Chacko discloses conductive compositions containing nanomaterials (Column 1, lines 9-11) and specifically comprising 5-30 wt.% of polymer resin and 1-20 wt.% carbon nanoparticles. The carbon nanoparticles may be carbon nanotubes (Column 2, lines 33-47). The polymer should have a high glass transition temperature and polyimides are preferred polymers (Column 3, lines 35-45). The nanoparticles are used in the range of 0.025-20 wt.% of the composition (Column 4, lines 61-65). The composition may be applied to a substrate and the wet film thickness is typically 40 microns (Column 6, lines 29-31). With regards to the surface electrical resistivity, the volume electrical resistivity, and the mechanical elongation, the Examiner takes the position that the conductive film taught by Chacko would inherently have the same electrical resistivity, the same volume electrical resistivity, and same the mechanical elongation given that the chemical composition and the structure, i.e., the thickness of the film, of the conductive film taught by Chacko and that of the claimed invention are identical. All limitations of claims 1-6 are either inherent or disclosed in the above reference.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 5, and 7-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schlueter, Jr. et al. (US 6,201,945) in view of Chacko (US 6,617,377 B2).

Schlueter, Jr. et al. disclose a polyimide film containing electrically conductive doped metal oxide filler dispersed therein and wherein the polyimide film has a surface resistivity of from 10^4 to 10^{12} ohm/sq (Column 4, lines 3-7), a volume resistivity of from 10 to 1011 ohm.cm (Column 8, lines 50-60) and has a thickness of from about 25 to about 150 microns thick (Column 8, lines 41-45). The film is prepared by using a reaction product of a diamine and a dianhydride dissolved in a solvent, adding and dispersing an appropriate amount of filler, casting the mixture on a surface, removing the solvent by evaporation and heating to convert the polyamic acid to polyimide (Column 9, lines 15-30).

Schlueter, Jr. et al. do not disclose that the electrically conductive filler may be carbon nanotubes.

However, Chacko discloses conductive compositions containing nanomaterials (Column 1, lines 9-11) and specifically comprising 5-30 wt.% of polymer resin and 1-20 wt.% carbon nanoparticles. The carbon nanoparticles may be carbon nanotubes (Column 2, lines 33-47). The polymer should have a high glass transition temperature and polyimides are preferred polymers (Column 3, lines 35-45). The nanoparticles are used in the range of 0.025-20 wt.% of the composition (Column 4, lines 61-65). The composition may be applied to a substrate and the wet film thickness is typically 40

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microns (Column 6, lines 29-31). Chacko specifically teaches that the mechanical and thermal properties of the film can be increased by the incorporation of materials of nano-dimensions and the function of the nanoparticles is to increase the polymer-filler interactions (Column 2, lines 48-60).

Accordingly, it would have been obvious to one having ordinary skill in the art to replace the electrically conductive doped metal oxide filler of Schlueter, Jr. et al. with the carbon nanotubes taught by Chacko given that Chacko specifically teaches that the mechanical and thermal properties of the film can be increased by the incorporation of materials of nano-dimensions and the function of the nanoparticles is to increase the polymer-filler interactions. With regards to the mechanical elongation, the Examiner takes the position that the conductive film taught by Schlueter, Jr. et al. and Chacko would inherently have the same the mechanical elongation given that the chemical composition and the structure, i.e., the thickness of the film, of the conductive film as taught by Schlueter, Jr. et al. and Chacko and that of the claimed invention are identical.

Response to Arguments

5. Applicant's arguments filed on February 16, 2005 have been fully considered but they are not persuasive. Applicants traverse the rejection of claim 1, 2, and 5 under 35 U.S.C. 102(e) as being anticipated by Chacko (US 6,617,377 B2) and the rejection of claims 1, 2, 5, and 7-12 under 35 U.S.C. 103(a) as being unpatentable over Schlueter, Jr. et al. (US 6,201,945) in view of Chacko (US 6,617,377 B2) submit that neither Chacko nor Schlueter teach how to form a film having both superior mechanical

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elongation and low electrically resistivity. In response, the Examiner would like to point out that claims 1, 2, and 5 are directed to an article and not a process of making the article and hence Chacko does not need to teach how to make the article in order to anticipate claims 1, 2, and 5. Furthermore, it would have been obvious to one having ordinary skill in the art to replace the electrically conductive doped metal oxide filler of Schlueter, Jr. et al. with the carbon nanotubes taught by Chacko given that Chacko specifically teaches that the mechanical and thermal properties of the film can be increased by the incorporation of materials of nano-dimensions and the function of the nanoparticles is to increase the polymer-filler interactions.

Hence, the above rejections are maintained.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sheeba Ahmed whose telephone number is (571)272-1504. The examiner can normally be reached on Mondays and Thursdays from 9:30am to 6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571)272-1284. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Sheeba Ahmed

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April 28, 2005